

Method of Forming Thin Silicone Oxide Films on Silicon Carbide Substrates

Abstract

Method and apparatus for forming thin silicon oxide films on silicon carbide substrates utilizing an afterglow thermal reactor. The method of forming thin silicon oxide film includes the steps of loading a silicon carbide substrate within a tube, which tube is heated, and the contents pressure is controlled. An oxidizing gas is then passed through an afterglow reactor source or microwave cavity where the gas achieves an excited state of energy. When the neutral species of the excited gas contact the silicon carbide substrate within the heated region of the tube, a thin silicon oxide film forms on the substrate, at a faster rate and lower temperature than has been known. The tube contents are maintained at a temperature between 600°C to 1,200°C, and at a pressure less than 50 torr.